

Technical Circular T-10/09

Date: November 17, 2009

To: All HQ Directors: Operations, Planning and Major Projects
All Regional Directors
All Regional Managers, Engineering
All District Managers, Transportation
All Regional Traffic Engineers
Traffic Safety Network
WorkSafe BC

Subject: Traffic Control for the Application of Quick Dry Pavement Marking

Background:

The British Columbia Ministry of Transportation and Infrastructure (MoTI) has accepted the use of quick dry paints for the application of pavement marking in the province. The use of quick dry paints in comparison to conventional paint speeds the application process thereby improving daily paint output and time to return to full traffic operations.

The installation of quick dry paints is a continuously moving operation requiring a need to update the current signing and coning guidelines used to prevent vehicles from tracking over wet paint. The current signing and coning layouts utilized for conventional marking operations are described in the Ministry's Traffic Control Manual for Work on Roadways Appendix B, Figures B1 and B2.

Policy:

The use of quick dry paints on Provincial highways shall use the guidelines as provided in the attachments in this Technical Circular.

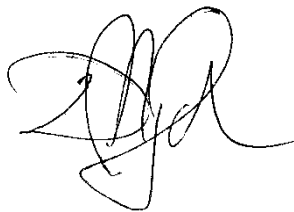
Scope and Application:

The attached figures and text document provide the typical layouts and vehicle operations to be used in quick dry paint operations on MoT highways. The figures provide guidance on the vehicle set-ups for the various lane and posted speed configurations found on provincial highways. The text document provides guidance for the users of the Escort, Buffer, and Shadow vehicles used in a quick dry paint marking applications. The use of Changeable Message Signs (CMS) also known as Dynamic Message Signs (DMS) play an integral role in the quick dry paint operation.

Attachments

Contact:

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A handwritten signature in black ink, appearing to read 'D. Nyland', with a horizontal line extending to the right from the end of the signature.

Dirk Nyland, P.Eng.
Chief Engineer



ESCORT, BUFFER AND SHADOW VEHICLE OPERATIONAL GUIDELINES

Traffic Control is Essential to facilitate highway safety and minimize traffic disruptions on Ministry roadways. Contractor should review the route that is to be painted and identify any constraints with due consideration for traffic volumes on the route, geometrics of route, and structures along the route that may impact highway operations. Contractor shall cause as little inconvenience as possible to the traveling public by minimizing delay and the platooning of traffic.

1. ESCORT TRUCK OPERATION

1.1. FUNCTION FOR QUICK DRY PAINT OPERATIONS:

- Warning device to traveling public;
- Carries supplies as needed;
- Transports personnel between jobsites;
- Communicates highway conditions, hazards, traffic flow to other vehicles involved in painting operation.

1.2. OPERATIONS: LINE PAINTING

1.2.1. Two Lane Two-way Rural Roadways (Passing not Permitted)

- The Escort Truck is driven in front of the paint truck at a distance of 200 – 500 meters depending on traffic volumes and sight conditions. On the front of the Escort truck is displayed the “Caution Paint Spray Truck Ahead” sign and the message board displays the caution pattern or a message which is visible to on-coming traffic, thus providing them with adequate warning of the painting operation. The operator shall have the STOP/SLOW Traffic Control Person (TCP) paddle for emergencies.
- The message board selections may be as follows:
 - “Line Painting” “Ahead”
 - “Line Painting” “Slow Down”

1.2.2. Two Lane Two-way Rural Roadways (Passing Controlled)

- When passing of the painting operation is controlled, this will require communication and coordinated traffic control between the Escort Truck Operator and the Buffer Truck Operator.

- Areas where passing is controlled are to be chosen very carefully taking in to consideration sight distances and traffic volumes.
- The Escort truck should be stopped as close to but not straddling the centerline, with good visibility to on-coming traffic.
- The Escort Truck Operator shall upon notification request evaluate sight distances and traffic conditions before initiating controlled passing. If conditions are satisfactory for controlled passing, the Escort Truck Operator shall select the following message on the message board:
 - “Stop”
- The Escort Truck Operator shall ensure all vehicles comply before passing of paint operation is allowed.
- The Escort Truck Operator shall remain holding stopped traffic until the last vehicle as described by the Buffer Truck operator in the passing procession has cleared the work zone. Notification shall be given to Buffer Truck Operator that passing is complete. The Escort Truck Operator shall elect the following message on the message board:
 - “Line Painting” “Ahead”
 - “Line Painting” “Slow Down”

Note: When traffic volumes are excessive and passing procession is large, the Paint Truck maybe required to cease painting operation until passing procession is completed. This shall also help reduce the length of passing zone required.

1.3. GENERAL DUTIES FOR QUICK DRY PAINT OPERATIONS:

- As designated by the foreman, measurements of road length and intersections/junction locations are recorded;
- The operator is on constant alert to unsafe conditions i.e.: Traffic build-up, wide loads, emergency vehicles, uncooperative motorists and relays this information to the Paint Truck.;
- The operator is responsible for coordinating traffic control in a safe manner with the Buffer Truck operator and the Paint Truck;
- The operator helps with the Paint Truck loading and general maintenance activities as directed by the foreman;
- The operator alerts the Paint Truck to any abnormalities they may encounter that affects painting application procedures and specifications;
- When conducting pre-lining, lay-out or other activities the operator participated by placing signs and cones, positioning the Escort Truck and helping the operation by flagging or performing other duties as directed by the foreman.

2. BUFFER TRUCK OPERATIONS

2.1. FUNCTION FOR QUICK DRY PAINT OPERATIONS:

- Acts as buffer truck for paint truck;
- Warning device to traveling public;
- Carries signs, parts, tools, templates, cones and supplies as needed;
- Quality control of the painted lines;
- Record measurements and landmarks as directed by the foreman;
- Transport personnel between jobsites;
- General Definition from BC Traffic Control Manual For Work On Roadways – A vehicle positioned in advance of an active stationary or moving work site to protect workers from errant vehicles (such vehicles shall display either a FAB or 360° light and 4-way flashers).

2.2. OPERATIONS: LINE PAINTING

2.2.1. Two Lane Two-Way Rural Roadway (Buffer Position- Passing Not Permitted)

- The Buffer Truck travels in the driving lane, following the Paint Truck at a distance of 200 – 400 metres, depending on sight distances and paint dry times. Ideally traffic will pass the Buffer Truck and Paint Truck at the same time. This will require communication and coordinated traffic control between the Buffer Truck Operator and the Escort Truck Operator.
- The Buffer Truck may display the following:
 - “Line Painting” “No Passing”
 - “Wet Paint” “No Passing”

2.2.2. Two Lane Two-way Rural Roadway (Buffer Position – Passing Controlled)

- When passing is required the Buffer Truck operator communicated notification request with Escort operator and waits for notification that on-coming traffic is “Stopped”. When it is safe to pass, the message board display is then changed and may display the following:
 - “Line Painting” “Pass on Left”
 - “Wet Paint” “Pass on Left”
- The Buffer Truck operator provides a description of last vehicle in passing procession to the Escort Truck operator. The message board is then displayed with the following message:
 - “Line Painting” “No Passing”
 - “Wet Paint” “No Passing”

Note: When traffic volumes are excessive and passing procession is large, the Paint Truck may be required to cease painting operation until passing procession is completed. This shall also help reduce the length of passing zone required.

2.2.3. Right Lane Multi-Lane Divided Highway

- When painting the right lane the Buffer Truck travels in the same lane as the Paint Truck following at a distance of 50 – 200 metres, depending on sight conditions. The message board selections may be as follows:
 - Left Chevron
 - “Wet Paint” “Keep Left”
 - “Line Painting” “Keep Left”
- Option: (High Traffic Volume) When painting the right lane an Escort Truck displaying left chevron on the arrow board may replace the Buffer Truck and follow the Paint Truck at a distance of 50 – 200 metres. The Buffer Truck would follow the Escort Truck at a distance of 200 – 300 metres. The message board selections may be as follows:
 - “Wet Paint” “Keep Left”
 - “Line Painting” “Keep Left”

2.2.4. Left Lane Multi-Lane Highway (Wide Shoulder)

- When painting the left lane the Buffer Truck travels in the same lane as the Paint Truck following at a distance of 50 – 200 metres, depending on sight conditions.
- The message board selections may be as follows:
 - Right Chevron
 - “Wet Paint” “Keep Right”
 - “Line Painting” “Keep Right”

2.2.5. Left Lane Multi-Lane Divided Highway (Narrow Shoulder)

- If the left shoulder is too narrow, the Buffer Truck follows the Paint Truck at a distance of 200 – 500 metres depending on sight conditions.
- The message board selections may be as follows:
 - Right Chevron
 - “Wet Paint” “Keep Right”
 - “Line Painting” “Keep Right”

2.3. GENERAL DUTIES FOR QUICK DRY PAINT OPERATIONS:

- The operator performs visual inspections of the painted lines and alerts the Paint Truck of abnormalities in dimensions, alignment, line quality etc.;
- As designated by the foreman, measurements of road length and intersection/ junction locations are recorded;
- The operator is on constant alert to unsafe conditions, ie: traffic build-up, wide loads, emergency vehicles, uncooperative motorists and relays this information to the Paint Truck;
- The operator helps with the Paint Truck loading and general maintenance as directed by the foreman;
- When conducting pre-lining, lay-out or other activities, the operator participates by placing signs and cones, positioning the Buffer Truck and helping the operation by flagging or painting as directed by the foreman.

3. SHADOW VEHICLE OPERATION

3.1. FUNCTION FOR QUICK DRY PAINT OPERATIONS :

- Traffic control and warning vehicle to the motoring public;
- Carries supplies as needed;
- Communicate highway conditions, hazards, traffic flow to the other vehicles involved in painting operation;
- Quality control recording of observations dimensions and location (rims) of painted lines on Q.C. Report;
- Communicate quality control findings to the paint truck and operators for corrective actions;
- Transports personnel between jobsites;
- General Definition from BC Traffic Control Manual For Work On Roadways – A vehicle used mainly in continuous slow moving operations, as a mobile advance warning and sign support. (Such a vehicle will normally travel as far over on the shoulder as possible, i.e. shadow vehicles do not block travelled lanes as do buffer vehicles).

3.2. OPERATION: LINE PAINTING

3.2.1. Two Lane Two-way Rural Roadway (Buffer Position)

- On a highway with 3 meter shoulder the Shadow Vehicle is driven along the right shoulder, not straddling the edge line, following the paint truck at a distance of approximately two kilometers. If the shoulder is too narrow the Shadow Vehicle will travel from approach to approach, parking parallel to the highway, keeping the signs and message board visible to approaching traffic. The two kilometer spacing is maintained in this situation as well. The message board will display the caution pattern or a select message as directed by the foreman.
- In situations where a wide load or emergency vehicle is approaching the painting operation all vehicles are alerted so they may take the appropriate action.

- The Message board selections, depending on circumstance, maybe as follows:
 - “Line Painting” “Ahead”
 - “Line Painting” “Next 2 km”
 - “Wet Paint” “Next 2 km”

3.2.2. Right Lane Multi-Lane Divided Highway

- When painting the right lane the Shadow Vehicle travels on the right shoulder, not straddling the edge line following the Paint Truck, at a distance of approximately 2 kilometers. The message board shall display the left chevron pattern or a selected message as directed by the foreman.
- The message board selections may be as follows;
 - Left Chevron
 - “Line Painting” “Keep Left”
 - “Line Painting” “Merge Left”

3.2.3. Left Lane Multi-Lane Highway (Wide Shoulder)

- When painting the left lane the Shadow Vehicle travels on the left shoulder, not straddling the median line following the Paint Truck, at a distance of approximately 2 kilometers. The message board displays the right chevron pattern or a selected message as directed by the foreman.
- The message board selections may be as follows;
 - Right Chevron
 - “Line Painting” “Keep Right”
 - “Line Painting” “Merge Right”

3.2.4. Left Lane Multi-Lane Highway (Narrow Shoulder)

- If the left shoulder is too narrow, the Shadow Vehicle travels on the right shoulder following the Paint Truck at a distance of approximately 2 kilometers.
- The message board selection may be as follows;
 - “Line Painting Ahead”
 - “Keep Right”

3.3. GENERAL DUTIES FOR QUICK DRY PAINT OPERATIONS:

- The operator performs visual inspections of the painted lines and alerts the Paint Truck of abnormalities in dimensions, alignment, line quality etc.,
- As designated by the foreman, measurements of road length and intersection/junction locations are recorded;

British Columbia Traffic Control Manual For Work On Roadways

- The operator is on constant alert to unsafe conditions, i.e.; traffic build-up, wide loads, emergency vehicles, uncooperative motorists and relays this information to the Paint Truck;
- The operator helps with Paint Truck loading and general maintenance as directed by the foreman;
- When conducting pre-lining, lay-out or other activities, the operator participates by placing signs and cones, positioning the Shadow Vehicle, and helping the operation by flagging or performing other duties as directed by the foreman.













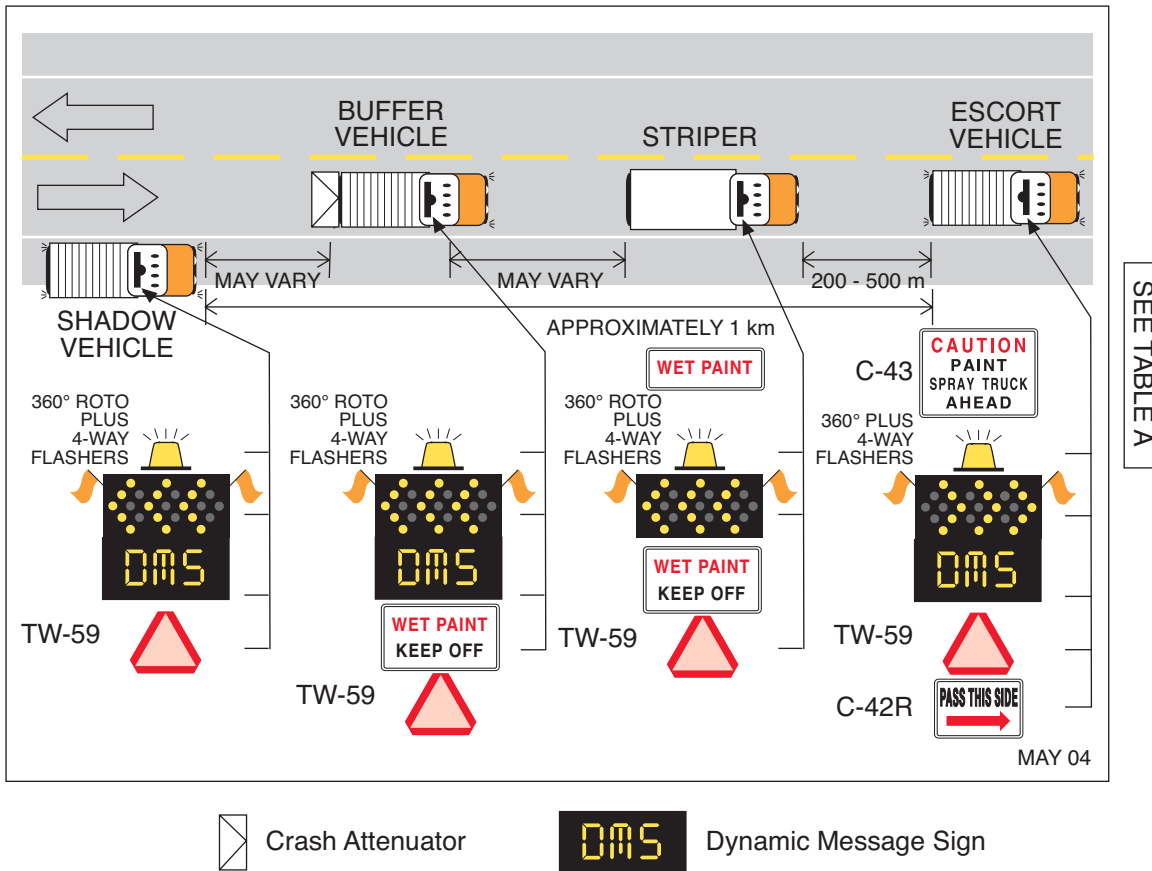
LEGEND	
	TUBULAR MARKER – TYPE D
	CONE – TYPE A, B or C
	SIGN
	TRAFFIC CONTROL PERSON (TCP)
	SHADOW, BUFFER or WORK VEHICLE
	(360°) FLASHING YELLOW LIGHT
	WORK AREA
	PORTABLE LANE CONTROL SIGNAL
	BARRICADES and FENCING
	FLASHING ARROW BOARD (FAB)
	DYNAMIC MESSAGE SIGN
	HIGH LEVEL WARNING DEVICE (HLWD)

Figure B.3 Quick-Dry Marking – Two Lane Two-way Rural Roadway

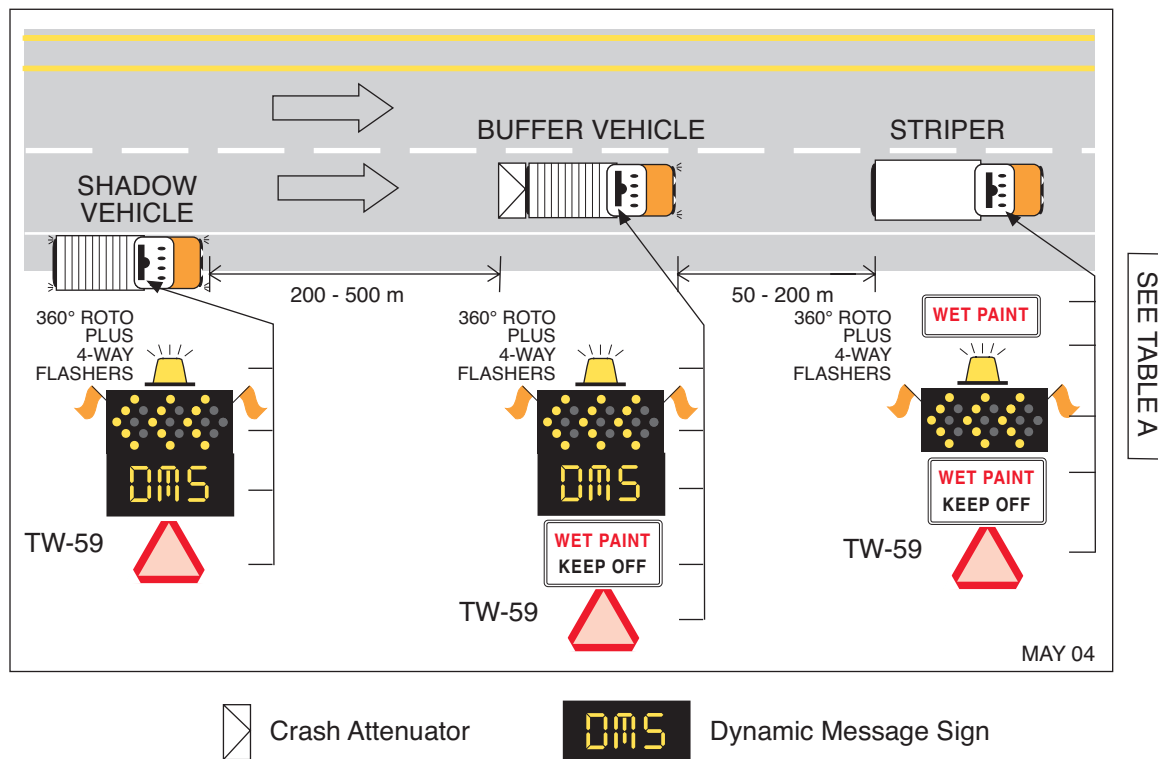


NOTE:

1. Consideration must be given to traffic volumes, sight distances, paint dry times and other factors to ensure traffic control devices are adequate in each instance.
2. Standard signs must be hinged or otherwise mounted to be visible only when painting is in progress.
3. Constant communication between all vehicles is necessary.

- Escort Vehicle – revolving light, signs, caution pattern or arrow on sequential arrowboard, message displayed on DMS, slow moving vehicle emblem and flags
- Striper – revolving light, signs, caution pattern or arrow on sequential arrowboard, slow moving vehicle emblem and flags
- Buffer Vehicle – revolving light, signs, caution pattern or arrow on sequential arrowboard, message displayed on DMS, slow moving vehicle emblem and flags
- Shadow Vehicle – revolving light, caution pattern or arrow on sequential arrowboard, message displayed on DMS, slow moving vehicle emblem and flags
- DMS will display messages appropriate to the necessary traffic control required.
- Truck mounted attenuator (NCHRP-350 TL-3 [100 km/hr]) to be used on Buffer Vehicle at all locations where posted speeds are 70 km/hr or greater.

Figure B.4 Quick-Dry Marking – Right-Lane Multi-lane Divided Highway



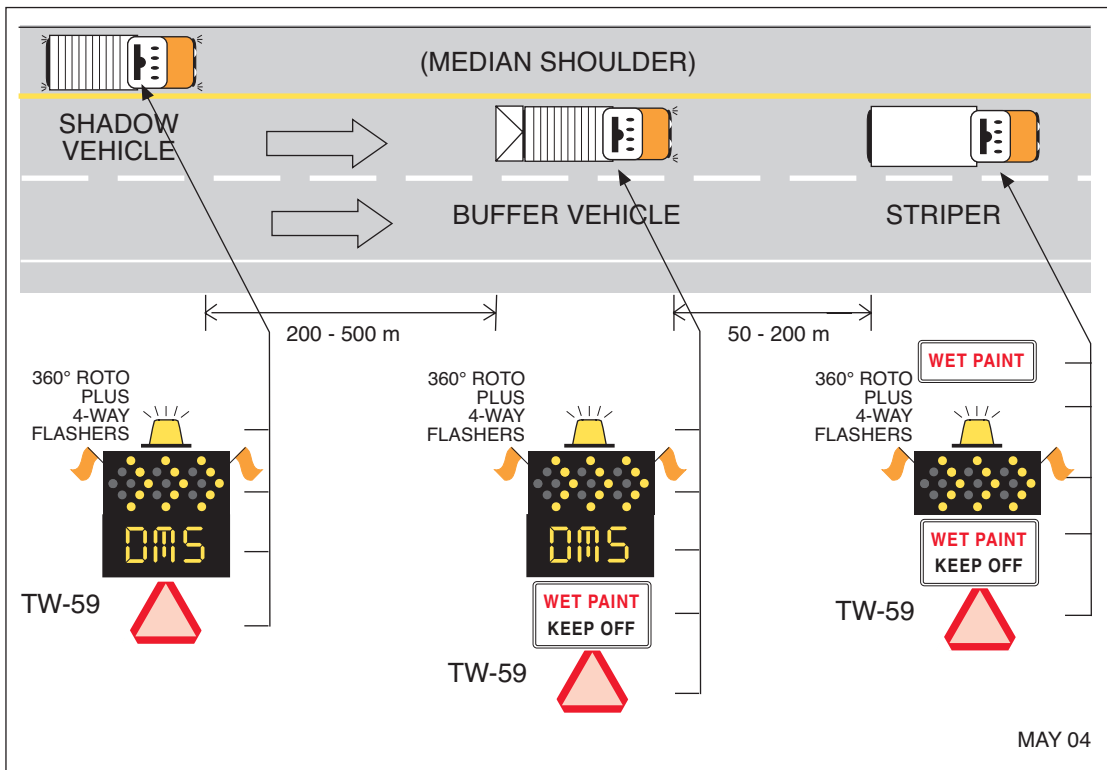
SEE TABLE A

MAY 04

NOTE:

1. Consideration must be given to traffic volumes, sight distances, paint dry times and other factors to ensure traffic control devices are adequate in each instance.
 2. Standard signs must be hinged or otherwise mounted to be visible only when painting is in progress.
 3. Constant communication between all vehicles is necessary.
- Striper – revolving light, signs, caution pattern or arrow on sequential arrowboard, slow moving vehicle emblem and flags
 - Buffer Vehicle – revolving light, signs, caution pattern or arrow on sequential arrowboard, message displayed on DMS, slow moving vehicle emblem and flags
 - Shadow Vehicle – revolving light, caution pattern or arrow on sequential arrowboard, message displayed on DMS, slow moving vehicle emblem and flags
 - DMS will display messages appropriate to the necessary traffic control required.
 - Truck mounted attenuator (NCHRP-350 TL-3 [100 km/hr]) to be used on Buffer Vehicle at all locations where posted speeds are 70 km/hr or greater.
 - Escort Vehicle to be added between Striper and Buffer Vehicles, as roadway and traffic conditions warrant. Adjust signage on Escort Vehicle as necessary.

Figure B.5 Quick-Dry Marking – Left-Lane Multi-lane Divided Highway Adequate Median Width



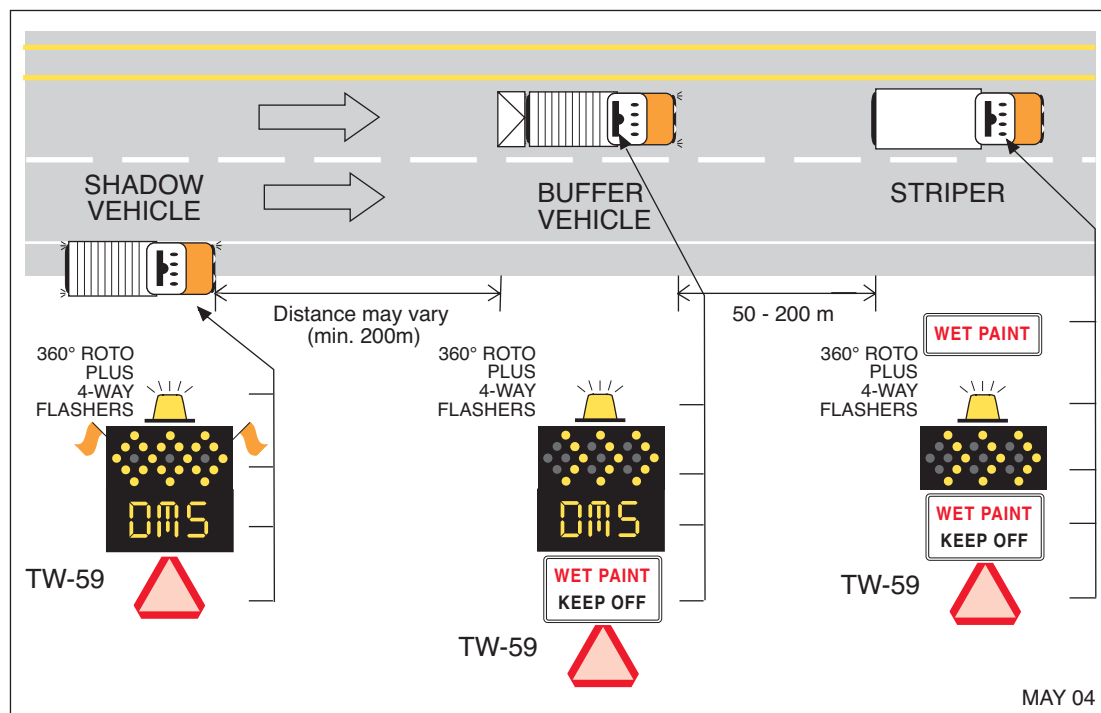
SEE TABLE A

NOTE:

1. Consideration must be given to traffic volumes, sight distances, paint dry times and other factors to ensure traffic control devices are adequate in each instance.
2. Standard signs must be hinged or otherwise mounted to be visible only when painting is in progress.
3. Constant communication between all vehicles is necessary.

- Striper – revolving light, signs, caution pattern or arrow on sequential arrowboard, slow moving vehicle emblem and flags
- Buffer Vehicle – revolving light, signs, caution pattern or arrow on sequential arrowboard, message displayed on DMS, slow moving vehicle emblem and flags
- Shadow Vehicle – revolving light, caution pattern or arrow on sequential arrowboard, message displayed on DMS, slow moving vehicle emblem and flags
- DMS will display messages appropriate to the necessary traffic control required.
- Truck mounted attenuator (NCHRP-350 TL-3 [100 km/hr]) to be used on Buffer Vehicle at all locations where posted speeds are 70 km/hr or greater.
- Escort Vehicle to be added between Striper and Buffer Vehicles, as roadway and traffic conditions warrant. Adjust signage on Escort Vehicle as necessary.

**Figure B.6 Quick-Dry Marking – Left-Lane Multi-lane Highway
Narrow Median Width**



SEE TABLE A



Crash Attenuator



Dynamic Message Sign

NOTE:

1. Consideration must be given to traffic volumes, sight distances, paint dry times and other factors to ensure traffic control devices are adequate in each instance.
 2. Standard signs must be hinged or otherwise mounted to be visible only when painting is in progress.
 3. Constant communication between all vehicles is necessary.
- Striper – revolving light, signs, caution pattern or arrow on sequential arrowboard, slow moving vehicle emblem and flags
 - Buffer Vehicle – revolving light, signs, caution pattern or arrow on sequential arrowboard, message displayed on DMS, slow moving vehicle emblem and flags
 - Shadow Vehicle – revolving light, caution pattern or arrow on sequential arrowboard, message displayed on DMS, slow moving vehicle emblem and flags
 - DMS will display messages appropriate to the necessary traffic control required.
 - Truck mounted attenuator (NCHRP-350 TL-3 [100 km/hr]) to be used on Buffer Vehicle at all locations where posted speeds are 70 km/hr or greater.
 - Escort Vehicle to be added between Striper and Buffer Vehicles, as roadway and traffic conditions warrant. Adjust signage on Escort Vehicle as necessary.